

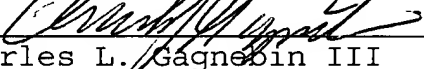
REMARKS

This Preliminary Amendment puts the claims into proper form for examination. Please note that all of the claims (1-51) have been amended and claims 52 and 53 have been added. Kindly calculate the filing fee based on the amended claims.

The Examiner is encouraged to telephone the undersigned attorney to discuss any matter which would expedite allowance of the present application.

Respectfully submitted,

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Enclosure

(Marked-up version for the convenience of the examiner)

1. An apparatus for conducting electrophysiological measurements on cells [(16)] comprising a measuring head [(20), the measuring head being] provided with at least one electrode [(30-36)] for impaling [the] said cells [(16), characterized in that the] wherein said electrodes [(30-36)] are integrated into a common support [(22)].
2. The apparatus of claim 1[, characterized in that the] wherein said electrodes [(30-36)] are inserted into recesses within [the] said support.
3. The apparatus of claim 1[, characterized in that the] wherein said electrodes [(30-36)] are molded into [the] said support.
4. The apparatus of [one or more claims 1 through 3, characterized in that the] claim 1 wherein said electrodes [(30, 34)] consist of pulled glass tubes.
5. The apparatus of [one or more of claims 1 through 4, characterized in that the] claim 1 wherein said electrodes

[(30, 34)] have an electrical resistance of between 5 M Ω and 100 M Ω .

6. The apparatus of [one or more of claims 1 through 4, characterized in that the] claim 1 wherein said electrodes [(30, 34)] have an electrical resistance of between 500 k Ω and 5 M Ω .

7. The apparatus of [one or more of claims 1 through 3, characterized in that the] claim 1 wherein said electrodes [(30-36)] are configured as wire electrodes.

8. The apparatus of claim 7[, characterized in that the] wherein said electrodes [(30-36)] are configured as silver wire electrodes.

9. The apparatus of claim 8[, characterized in that the] wherein said electrodes [(30-36)] are configured as silver wire electrodes provided with a chloride coating.

10. The apparatus of [one or more of claims 1 through 9, characterized in that] claim 1 wherein at least one electrode [(30-36)] has a straight section [(42, 46)].

11. The apparatus of [one or more of claims 1 through 9, characterized in that] claim 1 wherein at least one electrode [(30-36)] is provided with a tip [(44, 48)] at its front terminal end.
12. The apparatus of [one or more of claims 1 through 11, characterized in that] claim 1 wherein two electrodes [(30-36)] are arranged essentially symmetrical relative to a longitudinal axis [(24)] of [the] said carrier [(22)].
13. The apparatus of claim 12[, characterized in that the] wherein said electrodes [(30-34)] have a distance d at their free terminal end being between 50 μm and 800 μm [, preferably between 200 μm and 500 μm].
14. The apparatus of claim 12 [or 13, characterized in that] wherein at least one electrode [(30-36)] has a straight section [(42, 46), the] , said straight section [(42, 46)] enclosing an acute angle α with a longitudinal axis [(24)] of [the] said support [(22)].

15. The apparatus of claim 14[, characterized in that the] wherein said acute angle α is between 3° and 10° [, preferably 5°].
16. The apparatus of [one or more of claims 1 through 15, characterized in that the] claim 1 wherein said at least one electrode [(30-36)] is configured as a measuring electrode [(30, 34)].
17. The apparatus of claim 16[, characterized in that the] wherein said at least one measuring electrode [(34)] is coupled to a measuring amplifier [(56)].
18. The apparatus of claim 17[, characterized in that the] wherein said measuring amplifier [(56)] is adapted to be adjusted [(58)].
19. The apparatus of [one or more of claims 16 through 18, characterized in that the] claim 1 wherein said at least one measuring electrode [(30)] is connected to a current source [(50)].

20. The apparatus of claim 19[, characterized in that the] wherein said current source [(50)] is adapted to be adjusted [(52)].
21. The apparatus of [one or more of claims 1 through 20, characterized in that the] claim 1 wherein said at least one electrode [(30-36)] is configured as a reference electrode [(32, 36)].
22. The apparatus of claim 21[, characterized in that the] wherein said reference electrode [(32)] is connected to ground [(54)].
23. The apparatus of claim 21 [or 22, characterized in that] wherein two measuring electrodes [(30, 34)] and two reference electrodes [(32, 36)] are provided.
24. The apparatus of [one or more of claims 16 through 23, characterized in that the] claim 16 wherein said at least two measuring electrodes [(30, 34)] are arranged in a first common plane [(35)].

25. The apparatus of [one or more of claims 21 through 24, characterized in that] claim 21 wherein at least two reference electrodes [(32, 36)] are arranged in a second common plane [(37)].
26. The apparatus of claim 24 [and 25, characterized in that the] wherein said first and [the] said second plane [(35, 37)] extend parallel to each other and wherein at least two reference electrodes are arranged in a second common plane.
27. The apparatus of [one or more of claims 1 through 26, characterized in that] claim 1 wherein at least one perfusion conduit is arranged on said carrier [(22)].
28. The apparatus of claim 27[, characterized in that] wherein at least one perfusion conduit is a perfusion outlet [(38)].
29. The apparatus of [one or more of claims 16 through 28, characterized in that the] claim 16 wherein said perfusion inlet [(38) as] has a first end opening [(39)], [the] said perfusion inlet [(38)] being arranged essentially parallel with [the] said at least one measuring electrode [(30, 34)], [and that the] said first end opening [(39) is] being

located above a lower end of [the] said at least one measuring electrode [(30, 34)].

30. The apparatus of claim 14 [and 29, characterized in that the] wherein said perfusion inlet [(38)] is arranged essentially on [the] a symmetry axis between said measuring electrodes [(30, 34)] and wherein said perfusion inlet has a first end opening, said perfusion inlet being arranged essentially parallel with said at least one measuring electrode, said first end opening being located above a lower end of said at least one measuring electrode.

31. The apparatus of [one or more of claims 27 through 30, characterized in that the] claim 27 wherein said perfusion inlet [(38)] is connected to a conveyor pump [(70)].

32. The apparatus of claim 31[, characterized in that the] wherein said pump [(70)] is adapted to be adjusted [(72)].

33. The apparatus of [one or more of claims 27 through 32, characterized in that the] claim 27 wherein said perfusion inlet [(38)] is adapted to be connected to a plurality of storage containers via a controllable valve system.

34. The apparatus of claim 33[, characterized in that the] wherein said storage containers are arranged above [the] said perfusion inlet [(38)].

35. The apparatus of claim 33 [or 34, characterized in that the] wherein said at least one storage container contains a test liquid.

36. The apparatus of claim 33 [or 34, characterized in that the] wherein said at least one storage container contains a rinsing liquid.

37. The apparatus of [one or more of claims 27 through 36, characterized in that the] claim 27 wherein said perfusion conduit is a perfusion outlet [(40)].

38. The apparatus of claim 29 [and 37, characterized in that the] wherein said perfusion outlet [(40)] has a second end opening [(41)], [the] said second end opening [(41)] being located above the first end opening [(39)] and wherein said perfusion conduit is a perfusion outlet.

39. The apparatus of claim 38[, characterized in that the] wherein said end openings [(39, 41)] are oriented along opposite directions.
40. The apparatus of [one or more of claims 37 through 39, characterized in that the] claim 37 wherein said perfusion outlet [(40)] is connected to a suction pump [(74)].
41. The apparatus of claim 40[, characterized in that the] wherein said suction pump [(74)] is adapted to be adjusted [(76)].
42. The apparatus of claims 26, [28 and 37, characterized in that] wherein, as viewed on first plane [(35) the] , said perfusion inlet [(38)] is located in front of [the] said first plane [(35)] and [the] said perfusion outlet [(40)] is located behind [the] said second plane [(37)] and wherein said perfusion inlet has a first end opening, said perfusion inlet being arranged essentially parallel with said at least one measuring electrode, said first end opening being located above a lower end of said at least one measuring electrode and wherein said perfusion conduit is a perfusion outlet.

43. The apparatus of [one or more of claims 1 through 42, characterized in that] claim 1 wherein said at least one measuring head [(20)] is arranged on an actuator [(18)], [the] said actuator [(18)] being adapted to be displaced along a coordinate system [(14)] above a receptacle for [the] said cells [(16)].
44. The apparatus of claim 43[, characterized in that the] wherein said actuator [(18)] carries a plurality of measuring heads [(20, 20a, 20b)].
45. The apparatus of claim 44[, characterized in that the] wherein said measuring heads [(20)] are adapted to be displaced individually relative to [the] said actuator [(18)] along [the] said axis z directed towards [the] said cell [(16)].
46. The apparatus of [one or more of claims 43 through 45, characterized in that the] claim 43 wherein said measuring head [(20)] is affixed to [the] said actuator [(18)] by plugging or screwing.

47. The apparatus of [one or more of claims 1 through 46, characterized in that] claim 1 wherein means are provided for injecting cDNA and/or mRNA into said cell [(16)].
48. The apparatus of claim 47[, characterized in that the] wherein said means are located on [the] said actuator [(18)].
49. The apparatus of [one or more of claims 43 through 48, characterized in that the] claim 43 wherein said receptacle for [the] said cell [(16)] is configured as a standardized multi-well-plate [(10)].
50. The apparatus of claim 49[, characterized in that the] wherein said individual receptacles [(12)] within said plate [(10)] are provided with a readable code [(13)], [the] said actuator [(18)] comprising means for reading [the] said code.
51. The apparatus of claim 50[, characterized in that the] wherein said code is a bar code [and that the] , said means [are] being a bar code reading head [(19)].